

UNCLASSIFIED



Stereo Characterization of IKONOS Imagery

Pete Gaska, NIMA, GITA, 314-263-4531

Steve Iversen, NIMA, IAW

1 March 2001

UNCLASSIFIED

UNCLASSIFIED



INTRODUCTION

- History
- Strategy Employed
- Data Review
- Conclusions

UNCLASSIFIED



History of GI Involvement

- Commercial Imagery Program (CIP) Tasking
 - Stereo Imagery for Gridded Area Photo (GAP)
 - Airfield Stereo Imagery available over an area with survey data
 - Plan to evaluate other airfields as they became available
 - Lack of stereo imagery over surveyed areas caused encroachment upon Civilian and Commercial Application Project (CCAP) imagery



Strategy (Evolving) Employed

- Overlap with Civilian and Commercial Application Project (CCAP)

NOTE: GI is not speaking for CCAP our data may be incorporated into their evaluation.

- GAP Scene
 - Inconclusive Results due to lack of Ground Truth
- Stereo Scene (Airfield)
 - Evaluation
- Testing & Evaluation (T&E) Scenes
 - Evaluation of Five Stereo Scenes

UNCLASSIFIED



Strategy (Evolving) Employed Continued

- Photo Identifiable Points
 - Points visible on IKONOS and Survey/T&E
 - Mensurate points
 - Determine Deltas in X, Y, and Z components between IKONOS stereo pairs and ground truth

UNCLASSIFIED

UNCLASSIFIED



Data Review

- Stereo View of IKONOS
 - Ingest
 - Parallax
 - Look

UNCLASSIFIED



UNCLASSIFIED

Airfield Scene (10 Points)

(units in meters)	Latitude	Longitude	Height	Straight Line
Mean	5.84	-0.90	-10.46	5.94
Std. Dev. (68)	0.60	0.57	0.69	0.56
Std. Dev. (90)	0.99	0.94	1.13	0.93
Maximum	6.64	-0.11	-9.38	6.77
Minimum	4.71	-1.57	-11.39	4.94



UNCLASSIFIED

Testing and Evaluation Scene 1 (10 Points)

(units in meters)	Latitude	Longitude	Height	Straight Line
Mean	-1.59	3.67	6.24	4.15
Std. Dev. (68)	0.96	1.08	1.09	0.83
Std. Dev. (90)	1.58	1.78	1.79	1.36
Maximum	-0.46	5.06	8.23	5.13
Minimum	-3.69	1.52	4.38	2.64

UNCLASSIFIED



UNCLASSIFIED

Testing and Evaluation Scene 2 (10 Points)

(units in meters)	Latitude	Longitude	Height	Straight Line
Mean	0.14	1.30	-7.07	1.50
Std. Dev. (68)	0.84	0.55	0.68	0.63
Std. Dev. (90)	1.38	0.90	1.12	1.03
Maximum	2.00	1.92	-5.89	2.44
Minimum	-0.98	0.47	-8.07	0.71

UNCLASSIFIED



UNCLASSIFIED

Testing and Evaluation Scene 3 (10 Points)

(units in meters)	Latitude	Longitude	Height	Straight Line
Mean	-0.30	2.08	13.50	2.22
Std. Dev. (68)	0.76	1.22	0.96	1.22
Std. Dev. (90)	1.25	2.00	1.58	2.01
Maximum	0.86	4.53	14.75	4.76
Minimum	-1.48	0.80	11.70	0.81

UNCLASSIFIED



UNCLASSIFIED

Testing and Evaluation Scene 4 (10 Points)

(units in meters)	Latitude	Longitude	Height	Straight Line
Mean	-1.22	6.70	1.22	6.84
Std. Dev. (68)	0.57	0.69	0.39	0.67
Std. Dev. (90)	0.94	1.14	0.65	1.10
Maximum	-0.22	7.58	1.90	7.77
Minimum	-2.04	5.48	0.69	5.84

UNCLASSIFIED



UNCLASSIFIED

Testing and Evaluation Scene 5 (3 Points)

(units in meters)	Latitude	Longitude	Height	Straight Line
Mean	-2.76	9.52	15.42	9.91
Std. Dev. (68)	0.17	0.61	0.35	0.54
Std. Dev. (90)	0.28	1.01	0.58	0.89
Maximum	-2.58	9.94	15.63	10.27
Minimum	-2.92	8.82	15.01	9.29

UNCLASSIFIED



Conclusions

(units in meters)	HA	VA
Airfield Scene	6.89	11.61
Scene 1	6.27	8.58
Scene 2	2.57	8.21
Scene 3	4.60	15.19
Scene 4	7.98	2.00
Scene 5	10.95	16.11



Summary

- History
- Strategy Employed
- Data Review
- Conclusions

UNCLASSIFIED



Questions or Comments?



UNCLASSIFIED